

1165-05-313

Hanbaek Lyu* (hlyu@math.ucla.edu) and **Igor Pak** (pak@math.ucla.edu). *On the number of contingency tables and the independence heuristic.*

We obtain sharp asymptotic estimates on the number of $n \times n$ contingency tables with two linear margins Cn and BCn . The results imply a second order phase transition on the number of such contingency tables, with a critical value at $B_c := 1 + \sqrt{1 + 1/C}$. As a consequence, for $B > B_c$, we prove that the classical *independence heuristic* leads to a large undercounting. (Received January 20, 2021)